

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

CONTOUR BUFFER STRIPS (Acre) CODE 332

DEFINITION

Narrow strips of permanent, herbaceous vegetative cover established across the slope and alternated down the slope with parallel, wider cropped strips.

Contour buffer strips are not considered part of the normal crop rotation for soil loss calculations.

This standard **does not apply** to situations where the width of the buffer strips will be equal to or exceed the width of the adjoining crop strips.

PURPOSES

- To reduce sheet and rill erosion.
- To reduce transport of sediment and other water-borne contaminants down slope, on-site or off-site.
- To enhance wildlife habitat

CRITERIA

Criteria Applicable to Both Reducing Sheet and Rill Erosion and Reducing Transport of Sediment and Water-Borne Contaminants

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sloping land where crops are grown. It is most effective on uniform slopes ranging from 4-8 percent. This practice is not suited to fields with slopes longer than 1.5 times the critical slope length. See critical slope length under criteria.

This practice is not well suited to rolling topography having a high degree of slope irregularity because of the difficulty of meeting row grade criteria.

Minimum Row Grade

Row grades for soils with slow to very slow infiltration rates (soil hydrologic groups C or D), or for crops sensitive to ponded water conditions for periods of less than 48 hours, shall be designed with positive row drainage of not less than 0.2 percent on slopes where ponding is a concern.

Maximum row grade

The row grade along the top edge of the buffer strip shall be as close to the contour as possible. The maximum row grade shall not exceed half of the RUSLE field slope percentage, or two percent, whichever is

less. Up to three percent row grade is allowed for a maximum of 150 feet when crop rows approach a stable outlet.

Fields where buffer strips are established should be farmed according to the contour farming standard 330, using established buffer strips as baselines and contour farming row grade criteria between the buffers.

Arrangement of Strips

Cropped strips will be alternated with buffer strips on the hill slopes. Placement of buffer strips will be site specific based on field conditions. Width of buffer strips will be based on desired erosion reductions and producer equipment size if strips are to be harvested.

Effectiveness of buffer strips will be evaluated using the Revised Universal Soil Loss Equation (RUSLE). This calculations includes the ration of buffer width to cropped width.

When used in combination with terraces or diversions, buffer strips shall be placed to facilitate cropping between the structures and the buffers. In some cases, buffer strips may be adjacent to these structures.

Critical Slope Length

Contour buffer strips are not considered effective when used on slopes longer than 1.5 times the critical slope length for contour farming.

The computation of critical slope length using RUSLE 2, shall be used for this practice in all cases where RUSLE 2 is used for soil loss prediction.

Slope lengths can be reduced using terraces or diversions, or may be modified when crop residue levels are maintained in excess of 50% such as when crop sequences are completely no-tilled.

Width of Strips

Buffer strips shall be even width, except when a varying width buffer strip is needed to keep either a cropped strip adjacent to it even width or to meet row grade criteria.

Width of buffer strips at their narrowest point shall be no less than 15 feet for grasses or grass legume mixtures and no less than 30 feet when legumes are used alone.

Cropped strips should be even width when feasible. Strip widths shall not exceed 50 percent of the RUSLE slope length or 50 percent of the critical slope length for buffer strips which ever is less.

Stable Outlets

Concentrated flows from contour buffer strips shall be handled using grassed waterways, field borders and other stable outlets or areas.

Vegetation

Permanent vegetation grown on buffer strips designed to reduce sheet and rill erosion shall consist of grasses, legumes, or grass-legume mixtures and adapted to the site. No plants listed on the noxious weed list of the state will be established in a buffer strip cropping system.

The buffer strips shall have a Cropland Cover-Management Condition of 1 or 2 that provides protective cover and induces sediment deposition during periods when erosion is expected to occur on the crop strips.

Cropland Cover-Management Conditions are a part of the erosion prediction technology in the Revised Universal Soil Loss Equation (RUSLE) found in the Pa Technical Guide or in Agricultural Handbook 703.

Headlands/End Rows

On fields where row crops and tillage are a part of the rotation establish field borders or otherwise establish permanent sod where row grades exceed row grade criteria and slope lengths exceed 150 feet.

Additional Criteria to Reduce the Transport of Sediment and Other Water-Borne Contaminants Downslope

Vegetation

Buffer strips designed to reduce the transport of sediment and other water-borne contaminants shall be established to permanent sod forming vegetation. No plants listed on the noxious weed list of Pennsylvania will be established in a buffer strip cropping system.

Width of Strips

Buffer strip width shall be based on the minimum criteria given above to reduce sheet and rill erosion.

The maximum width of cropped strips between buffer strips shall not exceed 150 feet or half of the RUSLE slope length., which ever is less. Cropped strip width shall be designed to account for some multiple of full equipment width.

Arrangement of Strips

A buffer strip will be established at the bottom of the slope. The width of this strip will be two times the average width of the other buffer strips in the system.

Additional Criteria to Enhance Wildlife Habitat

To enhance wildlife habitat, a native warm season grass specie mixture, recommended for wildlife purposes, will be used where adapted.

Reduce mowing of buffer strips to every other year or every third year.

Mow only after the desired species of ground nesting birds have hatched. Allow for re-growth before the growing season ends.

To enhance wildlife cover, the width of buffer strips will be increased to 30 feet or wider as determined based on the requirements for nesting and escape cover of the target wildlife species.

CONSIDERATIONS

Consider adjusting buffer strip widths to reduce curves associated with irregular topography on crop strips, but the edge must meet the contour farming standard.

In drainage ways, consider establishing grassed waterways at least to the point of sharp curvature. Waterways should be wide enough to allow the equipment to be lifted and/or turned to meet the same rows across the turn strip.

Prior to layout, consider obstruction removal and changes in field boundaries to improve the effectiveness of the practice and the ease of farming, especially to minimize short rows.

Prior to layout, determine locations where baselines should be established to assure that buffer strips and crop strips can pass

obstructions or ridge saddles or other locations that may impact effectiveness and practicality of the layout.

Whenever possible, run buffer strips and/or crop strips parallel with fence lines or other barriers, as long as row gradient criteria are met. Account for access road widths when they must cross the field, and adjust the strip boundary on either side accordingly.

Some non-noxious weedy growth may be allowed in the strips as they provide an insect source for young birds. Also, consider adding native forbs to the seeding mixture when they are available.

The standing residual cover provides early and late season nesting and escape cover for many species of wildlife displaced from other mowed areas.

PLANS AND SPECIFICATIONS

Specifications for installation, operation, and maintenance of Contour Buffer Strips shall be prepared according to the Criteria, Considerations, and Operations and Maintenance described in this standard, and shall be recorded in narrative statements in conservation plans on specification sheets, job sheets or other acceptable documentation.

OPERATION AND MAINTENANCE

Conduct farming operations parallel to the strip boundaries.

On fields where row crops and tillage are a part of the rotation establish field borders or otherwise establish permanent sod where end row grades exceed row grade criteria.

Time mowing of buffer strips to maintain appropriate vegetative density and height for optimum trapping of sediment from the upslope cropped strip during the critical erosion period(s).

If wildlife enhancement is desired, delay mowing until after the desired species of ground nesting birds have hatched.

Fertilize buffer strips as needed to maintain stand density.

Mow sod turn strips and waterways at least annually.

Spot seed or totally renovate buffer strip systems when vegetation does not meet criteria for trapping sediment.

Redistribute sediment accumulations along the upslope edge of the buffer-crop strip interface upslope over the cultivated strip when needed to maintain uniform sheet flow along the buffer/cropped strip boundary.

If sediment accumulates below the upslope edge of the buffer strip to a depth of six inches relocate the buffer/cropped strip interface location. Cultivated strips and buffer strips shall be rotated so that a mature stand of protective cover is achieved in a newly established buffer strip immediately below or above the old buffer strip before removing the old buffer.

Alternate repositioning of buffer strips to maintain their relative position on the hill slope.

Renovate vegetated headlands or end row area as needed to keep ground cover above 65 percent.

REFERENCES

1. Soil Loss Prediction, Pa Technical Guide, RUSLE (Revised Universal Soil Loss Equation), USDA-NRCS, Harrisburg, Pa.
2. Predicting Soil Erosion by Water, A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE). 1997 USDA Agricultural Research Service, Agricultural Handbook No. 703

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.